

**IS 4376 : 2013**  
**(Reaffirmed 2018)**

भारतीय मानक

वस्त्रादि — पुरुषों के लिए छोटे सूती  
जाँधिए (ट्रंक) — विशिष्टि  
(दूसरा पुनरीक्षण)

*Indian Standard*

**TEXTILES — GENTS' COTTON SHORT DRAWERS  
(TRUNKS) — SPECIFICATION**

*( Second Revision )*

ICS 61.020

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**BUREAU OF INDIAN STANDARDS**  
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## FOREWORD

This Indian Standard (Second Revision) was adopted by the Bureau of Indian Standards, after the draft finalized by the Hosiery Sectional Committee had been approved by the Textile Division Council.

This standard was originally published in 1967 and was subsequently revised in year 1996. This standard has been revised again on the basis of experience gained in its implementation. Following major changes have been incorporated in this revision:

- a) Constructional particular of the drawer fabric has been specified.
- b) Requirement for elastic strap has been modified.
- c) Number of wales/dm, number of courses/dm and scouring loss requirements have been deleted.
- d) Requirement for colour fastness to washing and rubbing has been modified.
- e) Marking requirements has been modified.

The Committee responsible for the formulation of this standard is given in Annex C.

For the purpose of deciding whether a particular requirement of this standard is complied with, the final value, observed or calculated expressing the result of a test or analysis, shall be rounded off in accordance with IS 2 : 1960 'Rules for rounding off numerical values (*revised*)'. The number of significant places retained in the rounded off value should be the same as that of the specified value in this standard.

## *Indian Standard*

# TEXTILES — GENTS' COTTON SHORT DRAWERS (TRUNKS) — SPECIFICATION

## ( Second Revision )

### **1 SCOPE**

**1.1** This standard prescribes the constructional details and other particulars of plain knitted and rib knitted gents' cotton short drawers (trunks), scoured, bleached or dyed.

**1.2** This standard does not cover the general appearance, feel and shade of drawers (*see also 5.3*).

### **2 REFERENCES**

The standards given in Annex A contains provisions which through reference in this text, constitute provisions of this standard. At the time of publication, the editions indicated were valid. All standards are subject to revision and parties to agreements based on this standard are encouraged to investigate the possibility of applying the most recent editions of the standards indicated in Annex A.

### **3 TERMINOLOGY**

For the purpose of this standard, the definitions given in IS 3596 shall apply.

### **4 MANUFACTURE**

#### **4.1 Drawers**

The shape of drawers shall be generally as shown in Fig. 1. These shall be neatly tailored out of well and evenly knitted tubular fabric. The fabric shall be of uniform texture and appearance. It shall be of uniform tension throughout its length and free from spirals. It shall be scoured, bleached or dyed. The drawers shall not have any seams or joining along their two outer sides. The wales shall run along the length of the drawers. The fabric shall conform to construction particulars given in Table 1 for plain knitted drawers and Table 2 for rib knitted drawers.

**4.1.1** The mass of the drawer in grams per square meter shall be determined by the method given in **B-4**.

**4.1.2** Pockets; if required, may also be provided having dimensions and shape as agreed to between the buyer and the seller.

#### **4.2 Elastic Strap**

Drawers shall have outer woven elastic strap stitched

at the waist band or inner woven elastic strap shall be formed by the folding the raw edges of the fabric to a depth of minimum 25 mm and stitching it with flat stitches. In case of latter, a cotton tape having width of 25 mm preferably confirming to Variety No. 2 of IS 1895 or a suitable tape made out of same fabric that is used for fabricating the drawers shall be provided in waist fold for tying purposes. It shall be at least 30 cm longer than the corresponding waist girth. The outer and inner elastic tape shall conform to the following parameters:

a) *Outer elastic strap:*

- 1) Width of strap shall be minimum 25 mm.
- 2) Minimum mass per 100 m of finished strap shall be 1.7 kg.
- 3) Minimum number of ends of covered rubber in the strap shall be 20.
- 4) In 250 mm of finished strap, each covered rubber thread shall have a minimum of 160 mm of rubber core of not less than 0.6 mm diameter.
- 5) The minimum elongation of covered rubber shall be 160 percent under a load of 225 g with respect to specimen length of 100 mm.

b) *Inner elastic strap:*

- 1) Width of strap shall be minimum 25mm.
- 2) Minimum mass per 100 m of finished strap shall be 1.1 kg.
- 3) Minimum number of ends of covered rubber in the strap shall be 15.
- 4) In 250 mm of finished strap, each covered rubber thread shall have a minimum of 160 mm of rubber core of not less than 0.6 mm diameter.
- 5) The minimum elongation of covered rubber shall be 160 percent under a load of 225 g with respect to specimen length of 100 mm.

#### **4.3 Seams and Stitches**

**4.3.1** The type of stitch and count of sewing thread for stitching various portions of the drawers shall be as given in Table 3. Cotton sewing threads used for

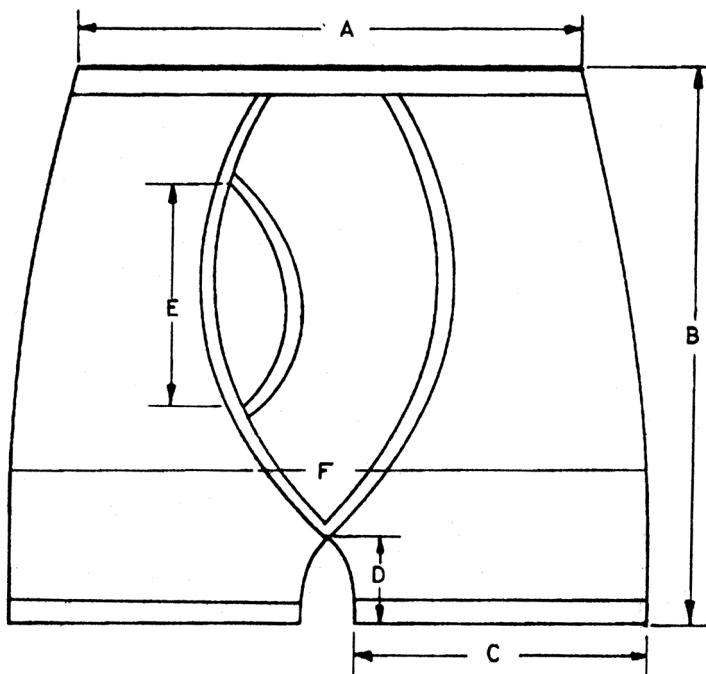


FIG. 1 TYPICAL SHAPE OF DRAWERS

**Table 1 Construction Particulars of Plain Knitted Fabric**  
(Clause 4.1)

Sl No.	Gauge of Machine <sup>1)</sup>	Approximate Count of Yarn-Cotton Count tex	Mass/m <sup>2</sup> Min g
(1)	(2)	(3)	(4)
i)	24 (Fine)	30s (19.5) - 40s (14.5)	115
ii)	26 (Super fine)	34s (17.0) - 50s (12.0)	110
iii)	28 (Extra Super fine)	40s (14.5) - 50s (12.0)	120

<sup>1)</sup>As determined by number of needles per 2.5 cm.

**Table 2 Construction Particulars of Rib Knitted Fabric**  
(Clause 4.1)

Sl No.	Gauge of Machine <sup>1)</sup>	Approximate Count of Yarn-Cotton Count tex	Mass/m <sup>2</sup> Min g
(1)	(2)	(3)	(4)
i)	14	30s (19.5) - 40s (14.5)	150
ii)	16	34s (17.0) - 50s (12.0)	150
iii)	18	38s (15.5) - 50s (12.0)	150

<sup>1)</sup>As determined by number of needles per 2.5 cm.

stitching shall be bleached or dyed according to the shade of drawers. For scoured drawers, the sewing thread used shall be bleached. Sewing thread of cross shade may also be used, if agreed to between the buyer and the seller.

**4.3.2** At the bottom of leg openings, the raw edges of the fabric shall be turned into a depth of 25 mm and shall be overlocked to form a hem of  $25 \pm 5$  mm width.

**4.3.3** All the stitches shall be secure and of even tension throughout with all the loose ends securely fastened. Threads in the looper and in the needle shall be properly adjusted and none of them shall be either too tight or too loose, so that proper elasticity of the seam to match that of fabric is maintained. The stitches shall be so elastic that they shall not give way when elastic waist is stretched to double its width and thigh openings are stretched to one and a quarter times their width.

#### 4.4 Freedom from Defects

The drawers shall be free from fabrication defects such as loose thread, missing stitches, oil stains, chemical damages and dyeing defects, such as un-even dyeing and streakiness in case of dyed drawers.

### 5 SPECIFIC REQUIREMENTS

#### 5.1 Dimensions

The dimensions of drawers of different sizes when measured by the method prescribed in **B-2** shall conform to requirements given in Table 4 read with Fig. 1.

**NOTE** — The size of a drawer is designated by a number which is the numerical value of the waist girth in centimetres.

*Example:* 85 size drawer represents a drawer with waist girth of 85 cm.

#### 5.2 Other Requirements

Drawers shall also conform to other requirements given in Table 5.

#### 5.3 Sealed Sample

If, in order to illustrate or specify the indeterminable characteristics, such as general appearance, feel and shade of drawers, a sample has been agreed upon and sealed, the supply shall be in conformity with sample in such respects.

**5.3.1** The custody of the sealed sample shall be a matter of prior agreement between the buyer and the seller.

### 6 MARKING

**6.1** A suitable cloth label made of woven cotton, taffeta/satin or fusing type shall be fastened or fused to each drawer at the inside near the waist band on which the following shall be indicated by printing:

**Table 3 Seams and Stitches**  
(Clause 4.3.1)

Sl No.	Portion to be Stitched	Type of Stitch/cm Min	Number of Stitches Thread	Approximate Count of Sewing Thread	Sewing Thread Conforming to
(1)	(2)	(3)	(4)	(5)	(6)
i)	Joining at inner sides of legs, back seams and part of front seam	3 thread overlock or flatlock	4	28s/2 cotton count (210 d tex × 2) in looper and 60s/3 cotton count (210 d tex × 3) in needle	Variety No. 2 and 15 respectively of IS 1720
ii)	Hemming at the bottom of legs and waist	2 or 3 thread overlock	4	-do-	-do-
iii)	Joinings at front opening	Lock stitch	4	60s/3 cotton count (210 d tex × 2)	Variety No. 15 of IS 1720

**Table 4 Dimensions**  
(Clause 5.1 and Fig. 1)

All dimensions in centimetres.

Sl No.	Size	Width Across Waist A	Front Length B	Width of Leg Opening C	Crutch Height D	Width of Front Opening E	Width Across Seat (Hip) F
(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
i)	75	29.0	32.0	17	6.0	9.5	36.0
ii)	80	30.5	33.5	18	6.5	9.5	37.5
iii)	85	32.0	35.0	19	6.5	10.0	39.0
iv)	90	33.5	36.5	20	7.0	10.0	40.5
v)	95	35.0	38.0	21	7.0	10.5	42.0
vi)	100	36.5	39.5	22	7.5	10.5	43.5
vii)	105	38.0	41.0	23	7.5	11.0	45.0
viii)	110	39.5	42.5	24	8.0	11.0	46.5
Tolerance		± 2.0	± 2.0	± 2.0	± 1.0	± 1.0	± 2.0

**NOTE** — Width across waist indicated is for drawers with elastic waist band. In case of drawers with draw tape, width across waist (A) shall be equal to the width across seat (F).

**Table 5 Requirements of Drawers**  
(Clause 5.2)

Sl No. (1)	Characteristic (2)	Requirement (3)	Methods of Test, Ref to (4)
i)	Dimensional change due to relaxation, percent, <i>Max</i> :		
a)	Wales	5	B-3
b)	Courses	5	B-3
ii)	pH value of aqueous extract (Cold method)	6.0 - 8.0	IS 1390
iii)	Colour fastness of dyed drawer to:		
a)	Light ( <i>see Note</i> )	4 or better	IS 2454 or IS 686
b)	Washing, Test C (3):		
1)	Change in colour	4 or better	IS/ISO 105 - C10
2)	Staining on adjacent fabric	4 or better	
c)	Perspiration (Acidic and alkaline):		
1)	Change in colour	4 or better	IS 971
2)	Staining on adjacent fabric	4 or better	
d)	Rubbing:		
1)	Dry	4 or better	
2)	Wet	3 or better	IS 766

NOTE — In case of dispute colour fastness to light shall be determined by the method prescribed in IS 686.

- a) Size of drawer;
- b) Indication of the source of manufacture;
- c) Washing instructions, if any; and
- d) Any other information required by the buyer.

NOTE — The colour from the label shall not bleed on to the drawer during storage or use.

## 6.2 BIS Certification Marking

The drawers may also be marked with the Standard Mark.

**6.2.1** The use of the Standard Mark is governed by the provisions of the *Bureau of Indian Standards Act, 1986* and Rules and Regulations made thereunder. The details of the conditions under which a license for the use of Standard Mark may be granted to manufacturers or producers may be obtained from the Bureau of Indian Standards.

## 7 PACKING

Drawers shall be packed as agreed to between the buyer and the seller preferably in bales or cases in accordance with IS 3325 or IS 3086 as the case may be.

## 8 SAMPLING AND CRITERIA FOR CONFORMITY

### 8.1 Lot

In any consignment, all the drawers of same size and manufactured from either plain knitted or rib knitted fabric of same count of yarn and delivered to a buyer against one despatch note shall constitute a lot.

**8.1.1** The conformity of a lot to the requirements of this specification shall be determined on the basis of the tests carried out on the samples selected from the lot.

**8.2** Unless otherwise agreed to between the buyer and the seller, number of drawers depending upon the size of the lot shall be selected at random from the lot to constitute the gross sample. The number of drawers so selected shall be in accordance with col 3 of Table 6.

**8.3** The number of drawers to be tested and criterion for conformity for each of the characteristics shall be as follows:

Characteristics	Number of Drawers to be Tested	Criterion for Conformity
Freedom from defects, mass/m and dimensions	See col 3 of Table 6	Non-conforming drawers not to exceed the corresponding number given in col 4 of Table 6
Dimensional change and pH value of aqueous extract	See col 5 of Table 6	All the drawers to satisfy the relevant requirements
Colour fastness	1 each of the same colour, shade and/or print for lot size up to 500 and 2 above 500	All the specimens to satisfy the relevant requirements

**Table 6 Sample Size and Permissible Number of Non-Conforming Drawers**  
(*Clauses 8.2 and 8.3*)

Sl No.	Number of Drawers in the Lot	Physical Characteristics		Number of Drawers to be Inspected (Other Requirements)
		Number of Drawers to be Inspected (3)	Permissible Number of Non-Conforming Drawers (4)	
(1)	(2)			(5)
i)	Up to 300	10	0	3
ii)	301 - 500	20	1	5
iii)	501 - 1 000	32	3	5
iv)	1 001 and above	50	5	8

## ANNEX A (*Clause 2*)

### LIST OF REFERRED INDIAN STANDARDS

IS No.	Title	IS No.	Title
686 : 1985	Methods for determination of colour fastness of textile materials to daylight ( <i>first revision</i> )	1895 : 1982	Cotton <i>NEWAR</i> ( <i>second revision</i> )
766 : 1988	Method for determination of colour fastness of textile materials to rubbing ( <i>first revision</i> )	2454 : 1985	Methods for determination of colour fastness of textile materials to artificial light (Xenon lamp) ( <i>first revision</i> )
971 : 1983	Method for determination of colour fastness of textile materials to perspiration ( <i>first revision</i> )	3086 : 1965	Code for seaworthy packaging of cotton hosiery yarn and goods
1390 : 1983	Methods for determination of pH value of aqueous extracts of textile materials ( <i>first revision</i> )	3325 : 1965	Code for inland packaging of cotton hosiery yarn and goods
1720 : 1978	Specification for cotton sewing threads ( <i>second revision</i> )	3596 : 1967	Glossary of terms relating to hosiery
		6359 : 1971	Method for conditioning of textiles
		IS/ISO105 - C10 : 2006	Textiles — Tests for colour fastness: Part C10 Colour fastness to washing with soap or soap and soda

## ANNEX B (*Clauses 4.1.1, 5.1 and Table 5*)

### METHOD OF TEST

#### B-1 CONDITIONING OF TEST SPECIMENS AND ATMOSPHERIC CONDITIONS FOR TESTING

The test specimens shall be tested in prevailing atmosphere. In case of dispute, the samples shall be conditioned and tested in the standard atmosphere as given in IS 6359.

#### B-2 DIMENSIONS

##### B-2.1 Procedure

Take a drawer. Lay it flat on a table. Remove by hand

all creases and wrinkles without distorting it. Measure the dimensions correct to nearest 0.5 cm.

#### B-3 DIMENSIONAL CHANGES (DUE TO RELAXATION)

##### B-3.1 Marking of Test Specimens

**B-3.1.1** Take a drawer from the test sample. Cut from it a test specimen measuring approximately 20 cm × 20 cm in such a way that the two of its sides are parallel in the direction of wales and the other two parallel in

the direction of courses. Mark the direction of wales and courses in the test specimen.

**B-3.1.2** Mark centrally on the test specimen, by means of indelible ink or a fast dyed cotton sewing thread, an area of 15 cm × 15 cm with two of its sides in the direction of wales and the other two in the direction of courses. Spread this test specimen on a flat smooth surface; carefully remove by hand all creases and wrinkles. Within this area, mark six pairs of marks, three pairs each in the wales direction and the courses direction in such way that the distance between each pair of marks is the same.

### B-3.2 Procedure

**B-3.2.1** Place the test specimen on a glass plate and carefully remove by hand all creases and wrinkles without distorting it and place the other glass plate on the test specimen. Measure, correct to the nearest millimetre, the distance between each pair of marks separately.

**B-3.2.2** Lay the test specimen flat in a tray of suitable size having minimum depth of 10 cm. Soak it under a head of 25 mm of water containing 0.5 percent suitable wetting agent at room temperature for 2 h. Drain out the water and remove the test specimen carefully so that it is not stretched and lay it flat on a smooth surface. Remove the excess of water by absorbent material and dry it at room temperature.

**B-3.2.3** After drying, condition the test specimen to moisture equilibrium at room temperature. Place it on the glass plate, carefully remove all wrinkles and creases and place the other glass plate on the test specimen. Measure correct to the nearest millimetre, distance between each pair of marks separately.

### B-3.3 Calculation

**B-3.3.1** Calculate, separately, the percentage of dimensional change both in the direction of wales and in the direction of courses by the following formula:

$$S = \frac{100 \times (a - b)}{a}$$

where

- S* = dimensional change, percent;  
*a* = distance between a pair of marks (along the wales or courses direction as the case may be) before soaking; and  
*b* = distance between the same pair of marks after soaking.

**B-3.3.2** Calculate separately the dimensional change between all the three pairs of marks in the direction of wales and in the direction of courses and calculate the average dimensional change in each direction.

### B-4 DETERMINATION OF MASS PER SQUARE METER

**B-4.1** Take a drawer from the test sample. Lay it flat on a table. Remove by hand all creases and wrinkles without distorting the specimen. Cut from it a test specimen measuring 20 cm × 20 cm in such a way that the two of its sides are parallel in the direction of wales and the other two parallel in the direction of courses.

**B-4.2** After conditioning the test specimen to moisture equilibrium at room temperature, measure the weight of the specimen nearest to 0.01 g using a suitable balance.

### B-4.3 Calculation

Calculate the mass per unit area of the specimen by the following formula:

$$M = \frac{W}{0.04}$$

where

- M* = mass of the specimen, in g/m<sup>2</sup>; and  
*W* = weight of 20 cm × 20 cm specimen, in g.

Similarly, determine the mass per unit area of at least four more test specimens and calculate the average of all the values obtained.

**ANNEX C**  
**(Foreword)**  
**COMMITTEE COMPOSITION**

Hosiery Sectional Committee, TXD 10

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Amendments are issued to standards as the need arises on the basis of comments. Standards are also reviewed periodically; a standard along with amendments is reaffirmed when such review indicates that no changes are needed; if the review indicates that changes are needed, it is taken up for revision. Users of Indian Standards should ascertain that they are in possession of the latest amendments or edition by referring to the latest issue of 'BIS Catalogue' and 'Standards : Monthly Additions'.

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### **Amendments Issued Since Publication**

Amend No.	Date of Issue	Text Affected

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